

Application No. 10/540659
Responsive to the office action dated August 5, 2009

REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

Claims 18-20 have been canceled without prejudice. Claims 21-29 have been amended to be in a form of a method claim as supported by previously presented claims 18-29 and the specification at page 15, line 4 – page 15, line 19 and page 20, line 9 – page 22, tables 2, 5, and 6 on pages 18, 24, and 25. Further, claim 21 has been amended to include a mass ratio of the polymerization solvent and cyclic compound relative to an amount of a solid portion in the polyimide precursor liquid composition and light transmittance of the polyimide coating film as supported by the specification at page 6, lines 17-20 and 23-29 and tables 2 and 6 on pages 18 and 25. Claim 22 has been amended as supported by the specification at page 6, lines 23-29 and tables 2 and 6 on pages 18 and 25. Claims 23-29 have been amended editorially. Claim 30 has been added as supported by canceled claims 18 and 20 and the specification at page 21, lines 8-21 as suggested. Claim 31 has been added as supported by table 2 on page 18 of the specification.

Table 5 on page 24 of the specification has been objected to because of informalities. Table 5 has been amended table 5 of the specification editorially herewith, as listed above. Accordingly, this objection should be withdrawn.

Claims 18-29 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (U.S. Patent No. 5,554,684) in view of Peters et al. (U.S. Patent No. 4,965,337), Hawley's Condensed Chemical Dictionary (14th Edition), and Matsumoto et al. (U.S. Patent No. 6,100,365). Applicants respectfully traverse this rejection.

Claim 21 is directed to manufacture a polyimide coating film, which has high transparency, i.e., high transmittance, and no. Choi discloses a method of forming a polyimide coating (see abstract). The reference, however, is silent about the transmittance of the polyimide coating film and thus fails to disclose the transmittance of

Application No. 10/540659

Responsive to the office action dated August 5, 2009

the polyimide coating film that is at least 60 % when the polyimide coating film has a thickness of $50 \pm 10 \mu\text{m}$ and is irradiated with light of 420 nm, as claim 21 recites. Choi also is silent about a discoloration problem or inclusion of the cyclic compound in the polyimide precursor liquid composition and thus fails to disclose the mass ratio of a solid portion, a polar polymerization solvent, and a cyclic compound in the polyimide precursor liquid composition as claim 21 recites. By including in the polyimide precursor liquid composition the cyclic compound, which has a five member ring-structure including a carbonyl group ($-\text{C}=\text{O}$) and thus has larger dipole moment and dielectric constant than polar organic solvents, the cyclic compound strongly solvates with polyamic acid due to the planar structure derived from the five-member ring and is substituted for the polar organic solvent and prevents discoloration, which occurs when heated (see page 5, line 14 – page 6, line 10). Thus, claim 21 is distinguished from Choi.

Like Choi, Peters is silent about the transmittance of the polyimide coating film and inclusion of the cyclic compound in the polyimide precursor liquid composition as claim 21 recites. Thus, Peters does not remedy the deficiencies of Choi.

Hawley's Condensed Chemical Dictionary shows a compound of propylene carbonate and is silent about a method of manufacturing a polyimide coating film, the polyimide precursor liquid composition for manufacturing a polyimide coating film, and properties of the film such as transmittance. Thus, the Hawley's reference does not remedy the deficiencies of Choi and Peters.

Matsumoto discloses a polyimide resin film, which has a light transmittance of at least 60 % when the thickness of the film is $10 \mu\text{m}$ (see abstract). There is a logarithmic dependence between transmittance of light and the distance of the light travels, i.e., the thickness of the material under Beer-Lambert Law. Therefore, when the thickness is increased from $10 \mu\text{m}$ to $50 \mu\text{m}$, the transmittance of the same material reduces by 1/10000. In addition, Matsumoto does not disclose the mass ratio in the polyimide precursor liquid composition of a solid portion, polar polymerization solvent, and the cyclic compounds. Thus, Matsumoto does not remedy the deficiencies of Choi, Peters, and Hawley's.

As discussed above, none of the references discloses the particular transmittance. The transmittance varies depending on the composition of the polyimide precursor liquid

Application No. 10/540659

Responsive to the office action dated August 5, 2009

(see tables 5 and 6 on pages 24 and 25, respectively, of the specification). Therefore, the combination of the references does not teach or suggests a method that utilizes the particular composition of the polyimide precursor liquid that provides the high transmittance of the polyimide coating film as claim 21 recites. Accordingly, claim 21 and claims 22-29, which ultimately depend from claim 21, are distinguished from Choi in view of Peters, Hawley's Condensed Chemical Dictionary, and Matsumoto, and this rejection should be withdrawn.

Claims 18-29 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (U.S. Patent No. 5,554,684) in view of Peters et al. (U.S. Patent No. 4,965,337), and Fujimoto et al. (Japanese Patent Application Publication No. 2000-305280). Applicants respectfully traverse this rejection.

Claim 21 and claims 22-29 are distinguished from Choi in view of Peters for at least the same reasons as discussed for claim 21 above.

Like Choi and Peters, Fujimoto is silent about the transmittance of the polyimide coating film and fails to disclose that the transmittance of the polyimide coating film is at least 60 % when the polyimide coating film has a thickness of $50 \pm 10 \mu\text{m}$ and is irradiated with light of 420 nm, as claim 21 recites.

In addition, Fujimoto suggests that by changing an amount of a solid portion, film thickness can be adjusted (see para. [0026]). The reference, however, does not disclose the mass ratio of a solid portion, polar polymerization solvent, and cyclic compound in the polyimide precursor liquid composition such that when the polyimide precursor liquid composition including a solid portion is in an amount of 100 mass parts, an amount of the polar polymerization solvent and that of the cyclic compound in the polyimide precursor liquid composition are in ranges of 150-900 mass parts and 15-750 mass parts, respectively, as claim 21 recites.

Accordingly, Fujimoto does not remedy the deficiencies of Choi and Peters, and this rejection should be withdrawn.

Application No. 10/540659

Responsive to the office action dated August 5, 2009

Claims 18-29 have been rejected under 35 U.S.C. 112, first paragraph, as not complying with the written description requirement. Applicants respectfully traverse this rejection.

Claim 21 includes the mass ratio of a solid portion, a polar polymerization solvent, and a cyclic compound in the polyimide precursor liquid composition such that when the polyimide precursor liquid composition including a solid portion is in an amount of 100 mass parts, an amount of the polar polymerization solvent and that of the cyclic compound in the polyimide precursor liquid composition are in ranges of 150-900 mass parts and 15-750 mass parts, respectively. Thus, the amount of the cyclic compound is well defined in claim 21 and clear. In addition, claim 21 defines the transmittance of the polyimide coating film measured at 420 nm, and the discoloration of the product is also controlled (see tables 2 and 6 on pages 18 and 25, respectively). Accordingly, this rejection should be withdrawn.

Claims 18-29 have been rejected under 35 U.S.C. 112, second paragraph, as indefinite. Applicants respectfully traverse this rejection.

As discussed above, claim 21 includes the mass ratio of a solid portion, a polar polymerization solvent, and a cyclic compound in the polyimide precursor liquid composition. Thus, the amount of the cyclic compound is well defined in claim 21 and clear. Accordingly, this rejection should be withdrawn.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

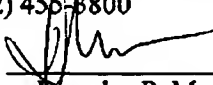


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DPM/my/jls

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